Operating Instructions

(Translation of original)

BRINKMANN pressure boosting pumps

FH2…FH6

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Brinkmann pressure boosting pumps series FH2 ... FH6

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1 Indication to the manual

This operating manual gives basic instructions which are to be observed during installation, operation and maintenance of the pump. It is therefore imperative that this manual be read by the responsible personnel and operator prior to assembly and commissioning. It is always to be kept available at the installation site.

1.1 Identification of safety instructions in the operating manual

Safety instructions given in this manual non-compliance with which would affect **safety** are identified by the following symbol

Safety sign according with ISO 3864 – B.3.1

or where **electrical safety** is involved, with:

Safety sign according with ISO 3864 – B.3.6

Where non-compliance with the safety instructions may cause a risk to the machine and it's function the word

ATTENTION

is inserted.

2 Description of product

2.1 General description of the pump

Pumps of this type are multi-stage rotary pumps. Series FH use closed impellers in order to minimizing power consumption and to optimize hydraulic pump efficiencies.
The pump shaft and the motor shaft are connected by a coupling. The pump shaft is sealed by a rotating mechanical seal.
These Pumps are not self-priming.
Pump and motor form a compact and space-saving unit.

The pumps can be mounted next to the coolant tank or the lined-up pump.

2.2 Intended use

In combination with pre-pumps or central coolant supply pumps of series FH work as pressure booster up to 26 bar increase within the limiting application in accordance with table 1.

Limit of Application (Table 1)

Type	FH2...FH6	
Mediums	Industry water, cooling emulsions, cooling- and cutting-oils	
Kinetic viscosity of the medium	...25 mm^2/s	
Temperature of medium	0 ... 80 °C	
max. inlet pressure	26 bar	
max. operating pressure	54 bar	
Particle-size in the medium	1 mm	
min. delivery volume	1% of Q max.	
Dry running	The pumps are not suitable for dry running.	
Switching-on frequency per hour	Motors less 3 kW from 3 kW to 4.0 kW from 5.0 kW to 10.3 kW	max. 200 max. 40 max. 20
Ambient temperature	40 °C	
Set-up altitude	1000 m	

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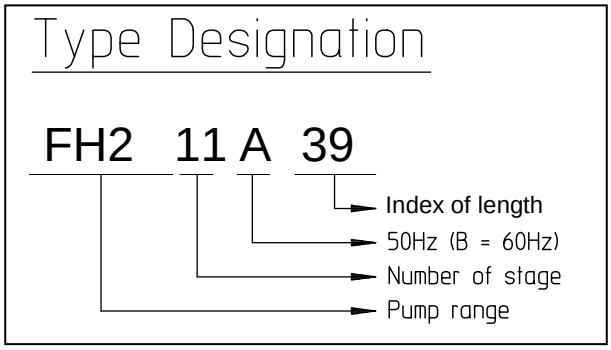
The pumps are to be operated within their design limits. Applications outside of these limits are not approved. The manufacturer is not responsible for any damages resulting from use of the pumps in such applications.

2.3 Type Designation



2.4 Technical data

50 Hz

Type	Max. del. pressure bar / spec. weight 1	Max. del. volume l/min	Height[1] **H** mm	Length[1] **l** mm	Weight kg	Power kW	Noise level[2] dBA
FH203A19	1.9	36	488	197	16.9	0.45	58
FH204A19	2.2				17.0		
FH205A19	2.8				17.1		
FH206A29	3.4		588	297	17.6		
FH207A29	4				17.7		
FH208A29	4.4	38	588	297	18.1	0.54	58
FH209A29	5.0				18.2		
FH210A29	5.8				18.3		
FH211A39	6.2		688	397	18.8		
FH212A39	6.8	42	706	397	20.6	0.75	58
FH213A39	7.5				20.7		
FH214A39	8.2				20.8		
FH215A39	9.0	42	706	397	21.7	0.92	58
FH216A49	9.5		806	497	22.2		
FH217A49	10.0				22.3		
FH218A49	10.6				22.4		
FH219A49	11.2	45	826	497	23.4	1.1	58
FH220A49	11.8				23.5		
FH221A59	12.2		926	597	24.0		
FH222A59	12.8				24.1		
FH223A59	13.7				24.2		
FH224A59	14.1	45	949	597	31.5	1.3	63
FH225A59	14.8				31.6		
FH226A69	15.5	45	1049	697	32.6	1.5	63
FH227A69	16.0				32.7		
FH228A69	16.8				32.8		
FH229A69	17.5	45	1049	697	33.3	1.7	63
FH230A69	18				33.4		
FH231A79	18.5		1149	797	33.9		
FH232A79	19.0				34.0		
FH233A79	19.6				34.1		
FH234A79	20.2	45	1173	797	38.1	1.9	63
FH235A79	20.8				38.2		
FH236A89	21.5		1273	897	38.7		
FH237A89	22.0	48	1273	897	39.3	2.2	63
FH238A89	22.6				39.4		
FH239A89	23.2				39.5		
FH240A89	24.0				39.6		

1) Dimensions in accordance with page 10

2) Noise emissions measured in accordance with DIN 45635 at a distance of 1 m

The motor is surface-cooled and compliant with DIN IEC 34 and EN 60034 (protection degree IP 55).

50 Hz

Type	Max. del. pressure bar / spec. weight 1	Max. del. volume l/min	Height[1] **H** mm	Length[1] **l** mm	Weight kg	Power kW	Noise level[2] dBA
FH403A19	2.0	70	488	197	16.9	0.45	58
FH404A19	2.8				17.0		
FH405A19	3.8	72	488	197	17.4	0.54	58
FH406A29	4.2		588	297	17.5		
FH407A29	5.1	75	606	297	20.3	0.75	58
FH408A29	5.9				20.4		
FH409A29	6.6				20.5		
FH410A29	7.3	80	606	297	21.5	0.92	58
FH411A39	8.0		706	397	22.0		
FH412A39	8.8	80	726	397	23.0	1.1	58
FH413A39	9.2				23.1		
FH414A39	10.1	85	749	397	30.4	1.3	63
FH415A39	11.0	85	749	397	31.0	1.5	63
FH416A49	11.9		849	497	31.1		
FH417A49	12.5	85	849	497	31.6	1.7	63
FH418A49	13.2				31.7		
FH419A49	14.0	85	873	497	35.8	1.9	63
FH420A49	14.8				35.9		
FH421A59	15.6	85	973	597	36.9	2.2	63
FH422A59	16.2				37.0		
FH423A59	17.0				37.1		
FH424A59	17.8				37.2		
FH425A59	18.6	90	983	597	37.8	2.6	63
FH426A69	19.2		1083	697	38.4		
FH427A69	20.0				38.5		
FH428A69	20.8				38.6		
FH429A69	21.7				38.7		
FH430A69	22.4				38.8		
FH431A79	23.2		1183	797	39.3		
FH432A79	24.0	90	1238	797	49.5	3.3	71
FH433A79	24.8				49.6		
FH434A79	25.4				49.7		
FH435A79	26.0				49.8		

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50 Hz

Type	Max. del. pressure bar / spec. weight 1	Max. del. volume l/min	Height[1] **H** mm	Length[1] **l** mm	Weight kg	Power kW	Noise level[2] dBA
FH603A19	2.0	140	488	197	17.1	0.54	58
FH604A19	2.8	140	506	197	19.0	0.75	58
FH605A24	3.8		506	247	19.3		
FH606A24	4.2	140	556	247	20.2	0.92	58
FH607A29	5.2		606	297	20.5		
FH608A29	6.0	140	626	297	21.5	1.1	58
FH609A34	6.8	140	699	347	29.0	1.5	63
FH610A34	7.6				29.1		
FH611A39	8.1	145	749	397	33.4	1.7	63
FH612A39	9.0	150	773	397	37.5	1.9	63
FH613A49	9.8	150	873	497	38.0	2.2	63
FH614A49	10.4				38.1		
FH615A49	11.2				38.2		
FH616A49	12.0	160	883	497	38.8	2.6	63
FH617A59	12.8		983	597	39.3		
FH618A59	13.2				42.5		
FH619A59	14.1	160	1038	597	53.1	3.3	71
FH620A59	15.1				53.2		
FH621A69	16.0		1138	697	53.7		
FH622A69	16.8				53.8		
FH623A69	17.6	170	1138	697	56.3	4.0	71
FH624A69	18.1				56.4		
FH625A79	19.0		1238	797	57.0		
FH626A79	19.8				57.1		
FH627A79	20.5	170	1274	797	73.7	5.0	71
FH628A79	21.2				73.8		
FH629A89	22.0		1374	897	74.3		
FH630A89	22.8				74.4		
FH631A89	23.5				74.5		
FH632A89	24.2				74.6		

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2) Noise emissions measured in accordance with DIN 45635 at a distance of 1 m

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60 Hz

Type	Max. del. pressure bar / spec. weight 1	Max. del. volume l/min	Height [1] **H** mm	Length[1] **l** mm	Weight kg	Power kW	Noise level[2] dBA
FH203B19	2.4	40	488	197	16.9	0.45	61
FH204B19	3.4				17.0		
FH205B19	4.1	42	488	197	17.4	0.54	61
FH206B29	5.1		588	297	17.9		
FH207B29	6	45	606	297	19.3	0.75	61
FH208B29	7.0				19.4		
FH209B29	7.8				19.5		
FH210B29	8.8				19.6		
FH211B39	9.6	48	706	397	20.9	0.92	61
FH212B39	10.2				21.0		
FH213B39	11.2				21.1		
FH214B39	12.0	48	726	397	22.1	1.1	61
FH215B39	12.8				22.2		
FH216B49	13.8	50	849	497	29.9	1.3	66
FH217B49	14.5	50	849	497	30.5	1.5	66
FH218B49	15.5				30.6		
FH219B49	16.4				30.7		
FH220B49	17.2	52	849	497	31.2	1.7	66
FH221B59	18.0		949	597	31.7		
FH222B59	19.0	55	973	597	35.7	1.9	66
FH223B59	19.9				35.8		
FH224B59	20.8	55	973	597	36.4	2.2	66
FH225B59	21.8				36.5		
FH226B69	22.5		1073		37.0		
FH227B69	23.2			697	37.1		
FH228B69	24.1	55	1083	697	37.5	2.6	66
FH229B69	25.0				37.8		
FH230B69	26.0				37.9		

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60 Hz

Type	Max. del. pressure bar / spec. weight 1	Max. del. volume l/min	Height[1] **H** mm	Length[1] **l** mm	Weight kg	Power kW	Noise level[2] dBA
FH403B19	3.2	84	488	197	17.2	0.54	61
FH404B19	4.2	84	506	197	19.6	0.75	61
FH405B19	5.3				19.7		
FH406B29	6.2	88	606	297	21.1	0.92	61
FH407B29	7.6	88	626	297	22.1	1.1	61
FH408B29	8.3				22.2		
FH409B29	9.5	92	649	297	29.5	1.3	66
FH410B29	11.8	92	649	297	30.1	1.5	66
FH411B39	10.6	95	749	397	30.6	1.7	
FH412B39	12.8				31.1		
FH413B39	13.9	95	773	397	35.1	1.9	66
FH414B39	15.0	100	773	397	35.7	2.2	66
FH415B39	16.0				35.8		
FH416B49	17.1	100	883	497	36.8	2.6	66
FH417B49	18.1				36.9		
FH418B49	19.2				37.0		
FH419B49	20.2	105	938	497	47.2	3.3	75
FH420B49	21.8				47.3		
FH421B59	22.5		1038	597	47.8		
FH422B59	23.8				47.9		
FH423B59	24.8				48.0		

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60 Hz

Type	Max. del. pressure bar / spec. weight 1	Max. del. volume l/min	Height [1] **H** mm	Length[1] **l** mm	Weight kg	Power kW	Noise level[2] dBA
FH603B19	3.2	170	506	197	18.9	0.75	61
FH604B19	4.2	170	506	197	20	0.92	61
FH605B24	5.2	170	576	247	20.8	1.1	61
FH606B24	6.2	175	599	247	27.9	1.5	66
FH607B29	7.8	175	649	297	32.2	1.7	66
FH608B29	8.4	185	673	297	36.3	1.9	66
FH609B34	9.8	185	723	347	37	2.2	66
FH610B34	10.8	195	733	347	37.6	2.6	66
FH611B39	12.0		783	397	38.1		
FH612B39	13.0				38.2		
FH613B49	14.0	195	938	497	52.1	3.3	75
FH614B49	15.2				52.2		
FH615B49	16.2				52.3		
FH616B49	17.8	200	938	497	54.8	4.0	75
FH617B59	18.4		1038	597	55.3		
FH618B59	19.8	200	1074	597	71.9	5.0	75
FH619B59	20.8				72.0		
FH620B59	22.0				72.1		
FH621B69	23.0		1174	697	72.6		
FH622B69	24.0				72.7		
FH623B69	25.2	210	1174	697	73.7	5.5	75
FH624B69	26.2				73.8		

1) Dimensions in accordance with page 10

2) Noise emissions measured in accordance with DIN 45635 at a distance of 1 m

The motor is surface-cooled and compliant with DIN IEC 34 and EN 60034 (protection degree IP 55).

3 Safety instructions

When operating the pump, the safety instructions contained in this manual, the relevant national accident prevention regulations and any other service and safety instructions issued by the plant operator are to be observed.

3.1 Hazards in the event of non-compliance with the safety instructions

Non-compliance with the safety instructions may produce a risk to the personnel as well as to the environment and the machine and results in a loss of any right to claim damages.
For example, non-compliance may involve the following hazards:

- Failure of important functions of the machines/plant
- Failure of specified procedures of maintenance and repair
- Exposure of people to electrical, mechanical and chemical hazards
- Endangering the environment due to hazardous substances being released

3.2 Unauthorized modes of operation

- Pump may not be used in potentially explosive environments**!**
- Pump and discharge piping are not designed to hold any weight and may not be used as a step ladder.

3.3 Remaining Risk

Risk of Injury!
Risk of squeezing or crushing body parts when installing or removing the pump exists. Proper and secured lifting tools must be used.

Risk of burns!
The pump must have cooled down sufficiently prior to commencing any repair, maintenance or installation.

3.4 Qualification and training of operating personnel

The personnel responsible for operation, maintenance, inspection and assembly must be adequately qualified. Scope of responsibility and supervision of the personnel must be exactly defined by the plant operator. If the staff does not have the necessary knowledge, they must be trained and instructed, which may be performed by the machine manufacturer or supplier on behalf of the plant operator. Moreover, the plant operator is to make sure that the contents of the operating manual are fully understood by the personnel.

3.5 Safety instructions relevant for operation

- If hot or cold machine components involve hazards, they must be guarded against accidental contact.
- Guards for moving parts (e.g. coupling) must not be removed from the machine while in operation.
- Any leakage of hazardous (e.g. explosive, toxic, hot) fluids (e.g. from the shaft seal) must be drained away so as to prevent any risk to persons or the environment. Statutory regulations are to be complied with.
- Hazards resulting from electricity are to be prevented (see for example, the VDE Specifications and the bye-laws of the local power supply utilities).
- The pumps are only secured safely if properly attached to the floor and to the lined-up pump or tank.
- The female threads on the motor MUST NOT be used to lift the entire pump and motor assembly.

3.6 Safety instructions relevant for maintenance, inspection and assembly work

Any work on the machine shall only be performed when it is at a standstill, it being imperative that the procedure for shutting down the machine described in this manual be followed.
Pumps and pump units which convey hazardous media must be decontaminated.
On completion of work all safety and protective facilities must be re-installed and made operative again.
Prior to restarting the machine, the instructions listed under “Start up” are to be observed.

3.7 Signs on the pump

It is imperative that signs affixed to the machine, e.g.:

- arrow indicating the direction of rotation
- symbols indicating fluid connections

be observed and kept legible.

3.8 Unauthorized alterations and production of spare parts

Any modification may be made to the machine only after consultation with the manufacturer. Using spare parts and accessories authorized by the manufacturer is in the interest of safety. Use of other parts may exempt the manufacturer from any liability.

4 Transport and storage

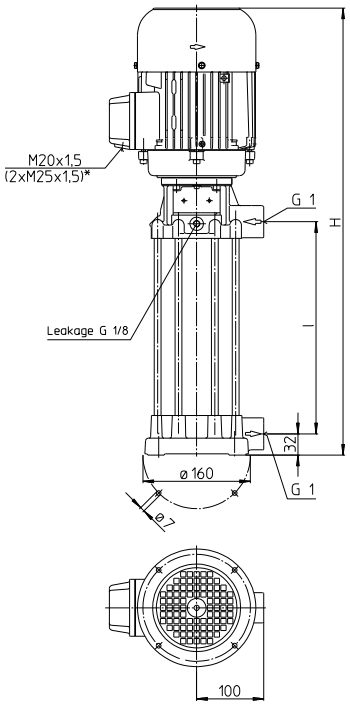
Protect the pump against damage when transporting.
The pumps may only be transported in a horizontal position and hooks or straps must be attached on the motor and pump end.
Do not use the pump shaft for connecting any transportation aids such as hooks or straps.
Pumps must be drained prior to their storage.
Store pump in dry and protected areas and protect it against penetration of foreign bodies.
Always store pump above the freezing point!

5 Installation and Connection

5.1 Mechanical installation

During any assembly or disassembly process the pumps must be secured against tipping trough ropes for example at all times.
Pumps must be mounted securely. Piping, tank and pumps must be mounted without any tension.
The liquid entrance is situated at the pump body. The pressure connection is at the connection cover in the end of the pump unit (They are marked with arrows).
Possible leakage will be caught by a leakage chamber and returned to the tank by means of a leakage line from the leakage bore on the upper side of the flange.
To obtain the full flow rate it is recommended to choose for the pipework the nominal bore diameter of the pumps cross section for connection. Therefore pipe bends should be used, not pipe angles!
The pipework must be qualified for occuring hydraulic pressure.

FH2...6



*) Dimensions. for 5.0 to 10 kW

ATTENTION

Pay attention of the max. tightening torque for piping connection

Type	Pipe connection	Cast iron	bronze
FH2...6	G 1	90 Nm	50 Nm

When installed the space around the pump must be large enough to provide sufficient cooling of the motor.

The suction port cannot support the weight of the supply pipe.

5.2 Electric wiring

All service work must be carried out by qualified service personnel. Pump must be disconnected from the power source and all rotating parts must stand still. Reassure that pump is disconnected from power source and cannot be switched on. Verify that there is no voltage at the terminal board!

According to the European Standard EN809 a motor overload must be installed and properly set to the full load amps stated on the pump name plate.

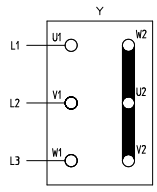
It is the responsibility of the machine operator to decide whether or not an additional emergency switch must be installed.

5.2.1 Circuit

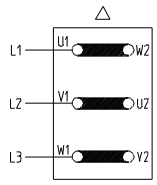
Tension voltage and frequency must correspond with the shown specification on the nameplate.
The pump must be wired so that a solid long term electrical connection is ensured. Establish a solid ground connection.

The electrical wiring must be performed according to the wiring diagram shown inside the terminal box cover. (Please see above sample wiring diagrams)

Wiring diagram e.g.



Star connection
3 x 400 V, 50 Hz
resp. 380-420 V, 50 Hz



Delta connection
3 x 230 V, 50 Hz
resp. 220-240 V, 50 Hz

There may be no foreign objects such as dirt, particles or humidity inside the terminal board.

Mount terminal board cover to motor tight against dust and humidity and close up all unused wiring ports.

ATTENTION

When Variable Frequency Drives are used interfering signals might occur.
Non-sinus shaped supply voltage from a variable frequency drive might result in elevated motor temperatures.

6 Start up / Shut down

6.1 Start up

ATTENTION

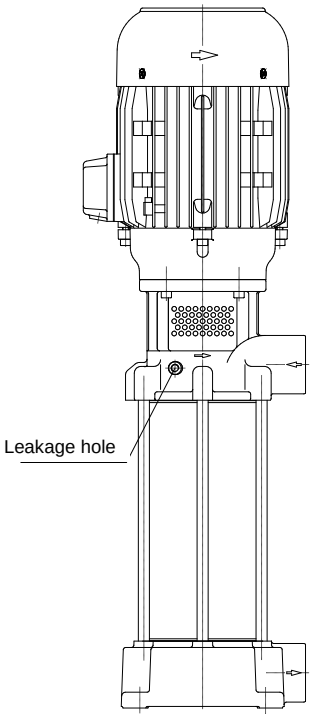
Switch off at the mains.
After connection the electrical wires, close the terminal box. Briefly start the motor (max. 30 sec.) and check the rotation according to the arrow on the top of the motor.
If the direction is incorrect change over two of the power leads.

6.2 Shut down

All service work must be carried out by qualified service personnel. Pump must be disconnected from the power source and all rotating parts must stand still. Reassure that pump is disconnected from power source and cannot be switched on. Verify that there is no voltage at the terminal board! Open terminal box and disconnect the power leads. Empty out the pump.

7 Operation

Liquid level
The valve on the suction side of the pump must be opened 1 or 2 seconds before starting up the pump to avoid the damage resulting from low pression. Do not switch on pressure boosting pump FH before positive inlet pressure by a primary pump or by a static head pressure (from a central filtration system) is established. Max. inlet pressure 26 bar. CAUTION: avoid hydraulic shocks!
Care has to be taken that the pump station will not run empty.



If the pump should lock up and cease, shut pump down (see 6.2) and disconnect from power supply. Pump must be uninstalled and removed from the system prior to its repair.

8 Servicing and Maintenance

ATTENTION

The surface of the motor must be kept free of dirt.

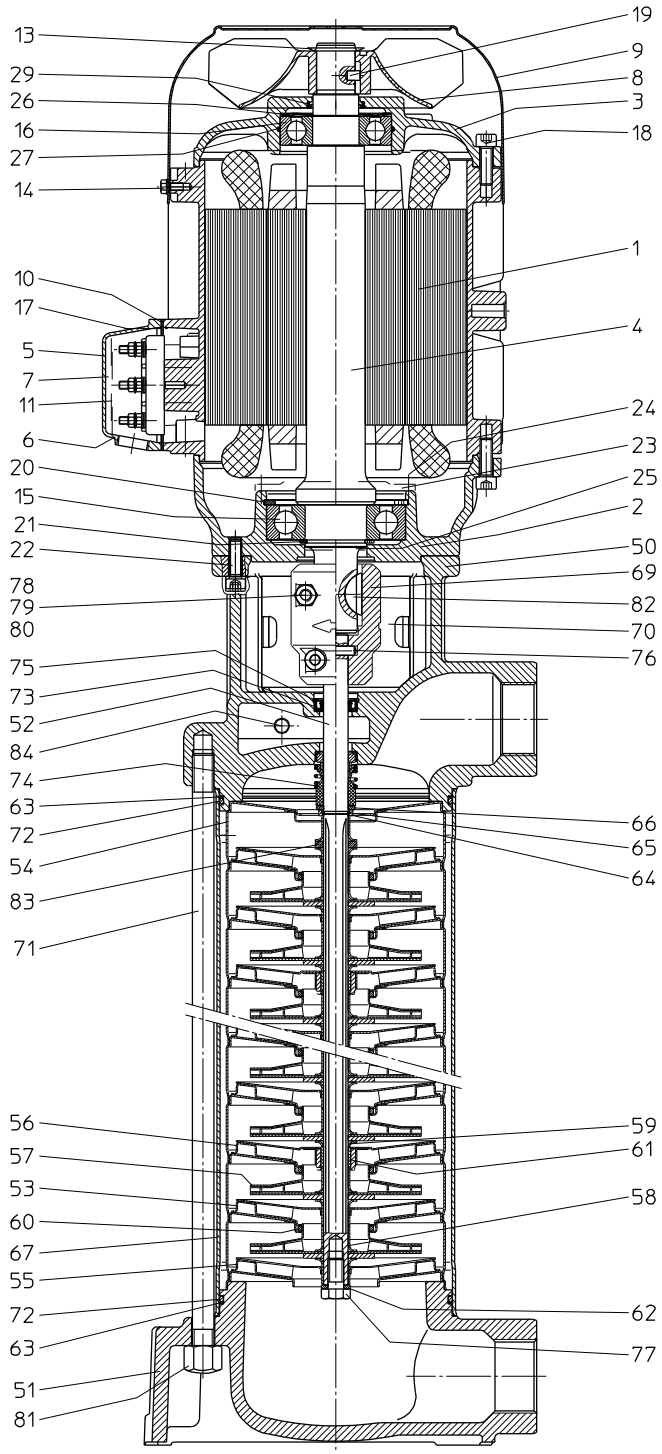
The motor shaft is spinning in permanently greased ball bearings (with special grease and increased bearing play) and does not require any special maintenance.

9 Trouble shooter's guide

Fault	Cause	Remedy
Motor does not start, no motor noise	At least two of the power supply leads have failed Overload has tripped	Check fuses, terminals and supply leads . Inspect overload
Motor does not start, humming noise	One of the supply leads has failed Impeller faulty Motor bearing faulty	See above Replace impeller Replace bearing
Overload trips	Pump locked up mechanically High on/of cycling frequency	Inspect pump hydraulics Check application
Power consumption is too high	Wrong direction of rotation of impeller Lime or other deposits mechanical friction	See above Clean pump mechanism repair pump
Motor overheats	High on/off cycling frequency Wrong power supply (voltage or cycles) Insufficient cooling	See above Power supply must correspond with name plate rating Check air flow at motor fan
Pump does not pump	Pre-pump does not work Pump mechanism faulty Pipe blocked	Check the pre-pump replace pump mechanism Clean pipe
Insufficient flow and pressure	Wrong direction of rotation of impeller Pump mechanism silted up Worn pump mechanism	Change over two power supply leads Clean pump mechanism Replace pump mechanism
Incorrect flow or pressure	Wrong power supply (voltage or cycles)	Power supply must correspond with name plate rating
Running noise/Vibration	Foreign objects in pump end Impeller damaged Bearing/Bushing broken	Remove foreign objects Replace impeller Replace bearing/bushing

10 Spare part

10.1 Spare part list for pressure boosting pumps series FH2…FH6



Item	Description		
1	Stator with terminal board		
2	Motor flange		
3	End shield		
4	Motor shaft with rotor		
5	Terminal box up to 4 kW		
6	Terminal box frame from 5.0 kW and over		
7	Terminal box cover from 5.0 kW and over		
8	Fan		
9	Fan cover		
10	Gasket		
11	Gasket from 5.0 kW and over		
13	Retaining ring		
13	Retaining ring 1.3…2.6 kW	DIN	471
14	Thread rolling screw from 1.3 kW and over	DIN	7500
15	Ball bearing	DIN	625
15	Ball bearing 1.3…2.6 kW	DIN	628
16	Ball bearing	DIN	625
17	Slotted cheese head screw	DIN	84
18	Stud bolt with bond up to 1.1 kW		
18	Hexagon socket head cap screw From 1.3 kW and over	DIN	912
19	Parallel pin	DIN	7
20	Retaining ring	DIN	472
21	Retaining ring	DIN	471
22	Socket head cap screw	DIN	912
26	Compensation disk		
27	O-ring from 1.3 kW and over		
29	Rotary shaft seal		
50	Pump body		
51	Connection cover		
52	Pump shaft		
53	Diffusor with sliding ring		
54	Entering stage with sliding ring		
55	Outflow stage		
56	Bearing stage with sliding ring		
57	Impeller		
58	Spacer-long 2 x per stage		
59	Spacer-short 1 x per bearing stage		
60	Sliding ring		
61	Shaft sleeve		
62	Supporting ring		
63	Spiral backup ring		
64	Mech. Seal stop ring cover		
65	Mech. seal stop half-ring		
66	Mech. seal stop ring		
67	Pump casing		
69	Clamp coupling		
70	Coupling shield with M5 screw		
71	Stud bolt		
72	O-ring		
73	Rotary shaft seal		
74	Mechanical seal		
75	Retaining ring		
76	Parallel pin	DIN	7
77	Hexagon head cap screw	DIN	933
78	Hexagon socket head cap screw	DIN	912
79	Serrated lock washer	DIN	6798
80	Hexagon nut	DIN	934
81	Hexagon cap nuts	DIN	917
82	Woodruff key	DIN	6888
83	Distance plate instead of impeller / 60 HZ		
84	Hexagon socket pipe plug	DIN	906

10.2 Indications to the spare part order

Spare parts are available from the supplier.
Standard commercially available parts are to be purchased in accordance with the model type.
The ordering of spare parts should contain the following details:

1. **Pumptype**
   e.g. FH607A29
2. **Pump No.**
   e.g. 080154120
   The date of the construction year is a component of the pumps type number.
3. **Voltage. Frequency and Power**
   Take item 1, 2 and 3 from the nameplate
4. **Spare part with item No.**
   e.g. Impeller item No. 57

11 Repair

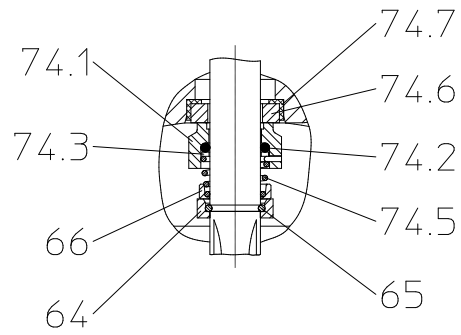
11.1 Exchange the rotary mechanical seal: FH2…FH6

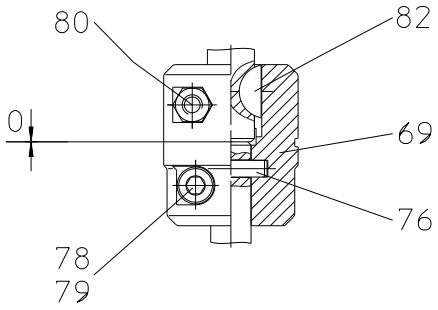
1) Disconnect the pump from the power supply.
2) Loosen the M5 screws and pull out coupling shield (70). Remove clamp coupling (69.1. 69.2) and parallel pin (76).
3) Loosen and pull off the hexagon cap nuts (81), the stud bolt (71), connection cover (51) and the pump casing (67) from the pump unit. Remove pump unit with pump shaft (52) from the pump body (50).
4) Take off rotating axial face seal unit (74.1-74.5) and mech. seal stop ring (66) from the shaft (52) and clean the shaft. Pay attention to the drilled hole for the parallel pin (76) that it is without any bur. Check the sliding surface for the rotary shaft seal (73) for any damage.
5) Remove complete seal (74.6. 74.7) from the pump body (50) and clean the seat.
6) Mounting of the new axial face seal :
   Ensure that the sliding surfaces of the ring and the rotating axial face seal unit are free from grease and dirt.
   Moisten the angle-sleeve (74.7) of the counter ring lightly with rinse water / (water with washing-up liquid) and push the unit into the seat of the pump body (50).
   Slide mech. seal stop ring (66) first and then the axial face seal (74.5-74.1) (**single part**) onto the pump shaft (52)
7) Lubricate lightly the lip of the rotary shaft seal (73) and push it into the pump body (50). Then insert the pump shaft (52) with the pump unit through the rotary shaft seal (73).
8) Fit together the coupling clamp (69) with the parallel pin (76) around the shafts, tighten the hexagon socket head cap screws (78) with the serrated lock washer (79) lightly.
   Be sure that the key of the motor shaft (4) coincides with the key groove of the coupling clamp (69.1). Press the pump shaft (52) toward the motor and tighten the screws.
   The distance between the two shaft ends **must be zero**.
9) Lubricate the O-ring seal (72)
   Put on the spiral-backup ring (63), the O-ring seal (72), the connection cover (51) and the pump casing (67) and screw evenly the stud bolt (71) and the hexagon cap nuts (81).
   During the assembly from (63) and (72) take care of the order. See the pump drawing.
10) Fit the coupling shield (70) into the pump body (50) and tighten the M5 screws.
11) Reconnect pump to the power supply.

Check direction of rotation!

Tightening torques for screwed connections

Thread - ∅	**M4**	**M5**	**M6**	**M8**	**M10**
Strength classes	4.8	4.8	8.8	8.8	8.8
Tightening torque (Nm)	**1** Nm	**3** Nm	**4.5** Nm **20** Nm Clamp coupling	**15** Nm **30** Nm Clamp coupling	**30** Nm





12 Disposal

When disposing of the pump or the packaging materials the local and national regulation for proper disposal must be complied with.
Prior to its disposal, the pump must be completely drained and decontaminated if necessary.

13 EC declaration of conformity

DEUTSCH / ENGLISH /FRANÇAIS / ESPAÑOL

BRINKMANN PUMPS

EG-Konformitätserklärung

EC declaration of conformity / Déclaration de conformité CE / Declaración de conformidad CE

Hersteller / Manufacturer / Constructeur / Fabricante

Brinkmann Pumpen. K. H. Brinkmann GmbH & Co. KG
Friedrichstraße 2. D-58791 Werdohl

Produktbezeichnung / Product name / Désignation du produit / Designación del producto

Druckerhöhungspumpen / Pressure Boosting Pumps / Pompes de surpression / Bombas de aumento la presión

Typ / Type / Tipo **FH2 … FH6**

Das bezeichnete Produkt stimmt mit den folgenden Richtlinien des Rates zur Angleichung der Rechtsvorschriften der EG-Mitgliedsstaaten überein:
The named product conforms to the following Council Directives on approximation of laws of the EEC Member States:
Le produit sus-mentionné est conforme aux Directives du Conseil concernant le rapprochement des législations des Etats membres CEE:
El producto designado cumple con las Directivas del Consejo relativas a la aproximación de las legislaciones de los Estados Miembros de la CEE:

2006/42/EG	Richtlinie für Maschinen
2006/42/EC	Council Directive for machinery
2006/42/CEE	Directive du Conseil pour les machines
2006/42/CEE	Directivas del Consejo para máquinas
2004/108/EG	Richtlinie für elektromagnetische Verträglichkeit
2004/108/EC	Council Directive for Electromagnetic compatibility
2004/108/CEE	Directive du Conseil pour Compatibilité électromagnétique
2004/108/CEE	Directivas del Consejo para Compatibilidad electromagnética

Hinsichtlich der elektrischen Gefahren wurden gemäß Anhang I Nr. 1.5.1 der Maschinenrichtlinie 2006/42/EG die Schutzziele der Niederspannungsrichtlinie 2006/95/EG eingehalten.
With respect to potential electrical hazards as stated in appendix I No. 1.5.1 of the machine guide lines 2006/42/EG all safety protection goals are met according to the low voltage guide lines 2006/95/EG.
Conformément à l'annexe I N° 1.5.1 de la Directive "Machines" (2006/42/CE) les objectifs de sécurité relatifs au matériel électrique de la Directive "Basse Tension" ont été respectés.
Con respecto al potencial peligro eléctrico como se indica en el apéndice I No. 1.5.1 del manual de la máquina 2006/42/EG. todos los medios de protección de seguridad se encuentran según la guía de bajo voltaje 2006/95/EG.

Die Übereinstimmung mit den Vorschriften dieser Richtlinien wird nachgewiesen durch die vollständige Einhaltung folgender Normen:
Conformity with the requirements of this Directives is testified by complete adherence to the following standards:
La conformité aux prescriptions de ces Directives est démontrée par la conformité intégrale avec les normes suivantes:
La conformidad con las prescripciones de estas directivas queda justificada por haber cumplido totalmente las siguientes normas:

Harmonisierte Europ. Normen / Harmonised Europ. Standards / Normes europ. harmonisées / Normas europ. armonizadas

EN 809 :1998+A1 :2009+AC :2010 EN ISO 12100 :2010 EN 60204-1 :2006/AC :2010 EN 61000-3-2 :2006/A2 :2009 EN 61000-3-3 :2013 EN 61000-6-2 :2005/AC :2005 EN 61000-6-3 :2007/A1 :2011/AC :2012

Nationale Normen / National Standards / Normes nationales / Normas nacionales: **EN 60034-1 :2010/AC :2010**

Die Hinweise in der Betriebsanleitung für den Einbau und die Inbetriebnahme der Pumpe sind zu beachten.

The instructions contained in the operating manual for installation and start up the pump have to be followed.

Les indications d'installation / montage et de mise en service de la pompe prévues dans l'instruction d'emploi doivent être suivies.

Tenga en cuenta las instrucciones en el manual para la instalación y puesta en marcha de la bomba.

Brinkmann Pumpen, K. H. Brinkmann GmbH & Co. KG

Werdohl. 11.08.2015

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Norbert Burkl Leiter Qualitätsmanagement / Manager of quality management / Directeur de gestion de la qualité / Director de gestión de calidad

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